

No. 14.

1936.

Geodætisk Institut

Proviantgaarden, Copenhagen, Denmark.

Bulletin

of the seismological station

SCORESBY-SUND

$\varphi = 70^{\circ}29' N.$ $\lambda = 21^{\circ}57' W.$ $h = 69$ m.

Lithologic foundation: Gneiss.

No. 14. Jan.—June 1936.

Instruments:

Galitzin-Wilip seismographs:

Constants:

Component	l	A_1	T_1		μ^2	T	k
	cm	cm	sec			sec	
N	12.0	100	11.8	$1/1-15/4$	-0.06	12.0	51
				$15/4-30/6$	0.02	12.0	99
E	12.0	100	11.9	$1/1-14/2$	0.0	10.5	49
				$14/2-15/4$	0.07	11.8	51
				$15/4-30/6$	-0.01	11.9	102
Z	14.9	100	10.02	$1/1-2/5$	0.1	8	62
				$2/5-30/6$	0.1	8	110

Time-corrections have been determined daily by means of Nauen scientific time-signals and time is known with an accuracy of about $1/10$ sec.

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No.	Date	Hour	Forerunners				L	Un-defined	△	Remarks
			P	S						
	1936									
	Jan.		<i>m s</i>	<i>m s</i>	<i>h m s</i>	<i>m s</i>	<i>h m</i>	<i>h m</i>	°	
1	2	0	39 48	41 48			42		11	
2	2	22			52 26	66.9				
3	4	15						3		
4	6	11					35			
5	14	0					38			
6	14	5			57 56	58 11	1.5			
7	14	7					.4			
8	14	13					.3			
9*	14*	14			27 29	i 35 0				
10	14	18			2 10	3 31	.7			
11*	15*	15			4.7	6 12	.8			
12	18	1			29.8	40.4				
13	20	8			19.8		.4			
14*	20*	17			14 10	i 21 10				
15	21	4						55		
16	21	5					.7			
	Febr.									
17	7	9		16 23			.5			
18	10	0					42			
	10									
19*	15*	13			6.2	15 43	.7			
20	16	15					31			
21	18	2					.7			
22	18	15					.2			
23	18	20						34		
24	21	1					.8			
25	21	6		42 29			1.1			
26	21	17			16 57	23 42	.9			
27*	22*	15			51 58	56 13	1.7			
28	22	19			43.4	54.4				
29	27	10			.5					
30	28	3					.5			
31	28	17					.4			
	March									
32	1	10		39 25	42.1	43.6				
33	1	11			8.6		.5			
34	2	3	29 59	38 50	30 14	39 14*	.8		67	
35	6	14			48.1		1.5			
36	10	12			22.7		.6			
37	10	20		55.6			1.2			
38	11	13						57		
39	14	10					.1			
40	17	20					.8			
41	20	19					.3			
42	21	0					.9			
43	21	2					.6			
44	22	12			46 10		1.1			

Small preceding movement.

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No.	Date	Hour	Forerunners				L	Un-defined	△	Remarks
			P	S						
			m s	m s	h m s	m s	h m	h m	°	
	1936									
	March									
45	22	23					.5			
46	25	8					49			
47	25	9			1.9		5			
48	25	11					39			
49	25	23					59			
50	26	9					.9		Faint.	
51	27	3					.1			
52	28	4						9		
	April									
53*	1*	2	23 23		i 27 40	33 58				
54	1	20			29.5	35 40	1.0			
55	2	6			46.0	52.3	1.2			
56	8	4						.6		
57	9	8					.3			
58	9	16			28 5	44	1.1			
59	12	0					.5			
60*	12*	21	4.9		8.4	15 34	.7		Marianne Islands.	
61	14	20					.2			
62	15	19					.9			
63	16	1			22.6		.9			
64	16	10					.0			
65	16	21					.0		No records 13 ^h 0 ^m —20 ^h 2 ^m .	
66	17	22					.8			
67	18	1					.7			
68*	19*	5	22 16		27 11	37.0	.9		Solomon Islands.	
69	19	9	16 57	27.9	27 37	33.9		45	P+. e _E 40 ^m .0. Andaman Islands.	
70	21	2			31					
71	22	10		19 26			.5		Atlantic Ocean.	
72	23	23	i 24 22				.7		P+. Aleutian Islands.	
73	26	9			13	20	.7			
74	27	0	10 41	20 15	25.1		.6		73 China.	
75	27	3						.9	Faint.	
76	27	6	41.9	50.9	55.0		1.0		P and S quite small, uncertain.	
77	28	6			9.0	15.4	.5		No records 12 ^h 42 ^m —16 ^h 19 ^m .	
78	28									
78	29	9					.9		29 ^d 12 ^h —30 ^d 12 ^h no time—marks.	
	May									
79	5	20					.7		Faint preceding movement.	
80	6	4			1.6					
81	7	2						38	Faint.	
82	7	10								
83*	8*	9			31 40	34 37			Borneo.	
84	8	15			45.5		1.1			
85	8	17		37.1	32 11	40.2			Alaska.	
86	9	6					.5		Faint.	
87	9	7					.7			

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No.	Date	Hour	Forerunners				L	Un-defined	△	Remarks				
			P		S									
			m	s	m	s	h	m	s	m	s	h	m	°
88	1936 May	6										.6		
89*	11*	17					47	3	56	50		1.3		East of New Guinea.
90	16	7	17	20	i26	55	20	8	31	41		.7		P—, e _Z 19 ^m 33 ^s . iPS 27 ^m 23 ^s . China.
91	18	10					43.1					45		
92	19	7					40	38	43	37				46 ^m .6; 49 ^m .2.
93	19	21					9.7		15	25				19 ^m .2. Record confused by two [other shocks.
94	20	0					39.3							
95*	20*	3	20.6				25	22	35.1			.9		Solomon Islands.
96	21	3					15	34	19.5			.8		SS 25 ^m .7.
97	22	0										29		Small.
98	22	0					41	0	42	21		1.2		PS 44 ^m .0. Argentina.
99	22	23					43	40				1.4		Small preceding movement.
100	24	17											.4	Seismic?
101	24	20					23.3		37.7					
102	25	3											25	Small.
103	25	8												
104	25	14										.4		Faint.
105	26	14										.0		Himalaya.
106*	27*	6	i30	18	i39	18	32	57	34.3					68
107	28	12					51	20				1.2		Beginning lost by change of sheets.
108	28	19	0	56	10	50	3.9		15	55		.4		78
109	29	15					1.6						8	P+, small. Pacific Ocean off Mexico.
110	30	15										.9		
111	30	16										.8		
112	June	11					42.1		43	24				68
113	1	3	6	29	15	29	15	59				27		57
114	3	9	25	0	32	55*	28	33	37.4			.7		P—, California.
115	5	14					58.0		61	46				e 64 ^m .8.
116	6	15										55		Small.
117	6	17										28		»
118	7	4					1.0					3		
119	7	4										42		e 40 ^m .5, forerunners or L?
120	7	11										26		
121	7	18										2		
122	9	0										.8		Faint.
	9													No records 12 ^h 50 ^m —19 ^h 33 ^m .
123	10	3										.6		
124	10	3			48.4		52.9		55.9			62		Superposed on preceding shock.
														No Z record. Baluchistan.
125*	10*	8					42	42	48	16		1.2		New Guinea.
126	10	17					38.1					45		
127	10	19					6	27				9		
128	11	4										.1		
129	11	10										.2		
130	12	16										.5		
131	13	0			47	36	50.6							Mediterranean Sea.

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No.	Date	Hour	Forerunners				L	Un-defined	△	Remarks
			P	S						
	1936 June		<i>m s</i>	<i>m s</i>	<i>h m s</i>	<i>m s</i>	<i>h m</i>	<i>h m</i>	°	
132	13	21					.0			No Z record.
133	14	2	37 14	44 54			54		55	P—, Kamchatka.
134	14	10			6 50		9			Greenland Sea.
135	14	17	9 50	16.7	11 33	20.0	26		47	P—, Asia Minor.
136	14	22					.0			
137	15	8					.5			Faint.
138	16	0			55.2	65.7	1.4			
139	16	19					.4			
140	19	17					.3			
141	20	2							36	
142	20	6					47			
143	20	7					.5			Superposed on preceding shock.
144	20	8			31.5		40			Forerunners small, uncertain.
145	20	14					.3			Faint.
146	21	15					.6			
147	22	19	37 1	45 11			.9		60	P—, Atlantic Ocean.
148	22	23					.2			Faint.
149*	23*	17					35			
150	23	17					37			
151	23	17					44			
152	23	18					47			
153	23	18					51			
154	23	20					0			
155	25	17			12 17	14 52				
156	26	5					5			Small.
157	26	20					59			»
158	27	3					25			Off Iceland.
159	27	3					28			» »
160	27	21	24 13	33.0			.7		66	Japan.
161	28	8					.3			Faint.
162	28	8	22 20	32 10	37.2				77	P uncertain, masked by preceding disturbance. Japan.
163	28	8	44 11	53 59					77	P quite small, uncertain. Superposed [on preceding shock.
164	28	17						44		
165*	29*	14	i39 35	47 16	40 54	41 44			55	Afghanistan.
166*	30*	15	i16 39	i24 43	19.0	28.6			59	Off Kamchatka.
167	30	19	35 46	43 38	48.2				57	Afghanistan.

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NOTES

- No. 9. Jan. 14. 14^h. Argentina; $\Delta = \text{ca. } 100^\circ$. Deep focus. (PP) 27^m29^s, small. e 31^m33^s. $i(S)$ 35^m0^s large on N . e 35^m43^s. (PS) 37^m48^s. $e(SS)_N$ 41^m.7. L small.
- No. 11. Jan. 15. 15^h. South Pacific near New Hebrides Islands; $\Delta = \text{ca. } 130^\circ$. PP 4^m.7. PKS 6^m12^s. PS 15^m.3. e 18^m.3. SSS 27^m.
- No. 14. Jan. 20. 17^h. Southeast of the Philippines; $\Delta = \text{ca. } 100^\circ$. E record only. PP 14^m10^s, not clearly marked; small preceding movement. SKS 20^m42^s; $iSKKS$ 21^m10^s; eS 22^m4^s. (PPS) 24^m17^s.
- No. 19. Febr. 15. 13^h. Banda Sea; $\Delta = \text{ca. } 110^\circ$. PP 6^m.2. SKS 12^m20^s; SKKS 13^m26^s. PS 15^m43^s, large; PPS 16^m.9. SS 22^m.5.
- No. 27. Febr. 22. 15^h. Pacific Ocean south of New Zealand; $\Delta = \text{ca. } 160^\circ$. P' 51^m58^s; P'_2 52^m.6; PP 56^m13^s. (SKS) 58^m.2. PPP 59^m58^s. (SKKS) 62^m.8. e 65^m10^s. SKSP 66^m30^s. PPS 69^m.4; e 71^m.4. SS 76^m.
- No. 53. April 1. 2^h. Pacific Ocean east of Philippine Islands. $\Delta = \text{ca. } 100^\circ$. No E record. P 23^m24^s, rather large; dilatation. P' 27^m.0, small. iPP 27^m40^s, large; PPP 29^m42^s. SKS 33^m58^s followed by large oscillations, but phases not clearly separated.
- No. 60. April 12. 21^h. Marianne Islands; $\Delta = \text{ca. } 100^\circ$. P small. e 8^m.4; 9^m.0. PPP 11^m.1. SKS 15^m34^s; PS 18^m.1. SS 23^m.5.
- No. 68. April 19. 5^h. Solomon Islands; $\Delta = \text{ca. } 120^\circ$. P small, but clearly marked; dilatation. iPP 27^m10^s. $e_{N,Z}$ 28^m34^s; 29^m.4. e_N 32^m32^s. e 33^m.7. e_Z 35^m.9. PS 37^m.0, large on N ; PPS 38^m12^s. SS 43^m.9; SSS 48^m.0.
- No. 83. May 8. 9^h. Borneo; $\Delta = \text{ca. } 100^\circ$. Deep focus. Small, but rather clearly marked phases: 31^m40^s; 34^m37^s; 35^m38^s; 37^m52^s; 38^m10^s; 39^m31^s. L quite small.
- No. 89. May 11. 17^h. East of New Guinea. $\Delta = \text{ca. } 115^\circ$. Phases clearly marked on N . PP 47^m3^s. e 48^m49^s. SKS 52^m53^s; (SKKS) 54^m7^s. PS 56^m50^s; i_Z 57^m5^s; PPS 57^m.9. SS 62^m.9; 63^m.7. SSS 67^m52^s.
- No. 95. May 20. 3^h. Solomon Islands; $\Delta = \text{ca. } 120^\circ$. P small. PP 25^m22^s; PPP 28^m.2. SKS 31^m.2; (S) 33^m23^s. PS 35^m.1. SS 41^m.8. e_N 44^m.5; e_E 45^m.2. e_N 46^m.8.
- No. 106. May 27. 6^h. Himalaya. $P(+0.8,+1.8,-1.9;-2.1,-4.3,+4.0)$. $P_c P$ 31^m13^s. PP 32^m57^s clearly marked on N ; on E some earlier movement. PPP_E 34^m.3. ($P_c S$)_N 35^m.6. iS_N 39^m18^s, large and well defined; eS_E 39^m28^s. smaller. $e(S_c S)$ 40^m14^s large on E . SS 43^m.7. 46^m.8 large oscillations on N ; SSS or L ?
- No. 125. June 10. 8^h. New Guinea; $\Delta = \text{ca. } 115^\circ$. Some depth of focus. No Z record. Quite small beginning about 41^m.6. e_N 42^m42^s. e 43^m24^s. e_N 48^m16^s; 49^m25^s; 50^m49^s. e_E 51^m29^s. $e_{N,E}$ 53^m31^s. e_E 58^m.7. e 59^m.5.
- No. 149. June 23. 17^h and succeeding 5 readings are of L waves of rather near shocks. The largest are the second and the fifth. The shocks are evidently repetitions from the same epicentre, the records being quite similar.
- No. 165. June 29. 14^h. Afghanistan. Deep focus. $P(+0.3,+1.5,-1.7;-0.7,-3.0,+3.3)$. $e_{N,E,Z}$ 40^m54^s. PP 41^m44^s; PPP_E 42^m.8. e_E 43^m58^s, rather large. S_N 47^m16^s; e_E 47^m32^s. e_E 48^m38^s, rather large; e_N 48^m59^s. SS 50^m.8; SSS 52^m.7. L small.
- No. 166. June 30. 15^h. Off Kamchatka. Strong record. $P(+5.2,-1.1,-15.0;-9.2,+2.9,+13.1)$. $e_{N,Z}$ 17^m.0. PP 19^m.0; PPP 20^m.4. ($P_c S$)_E 21^m.9. iS 24^m43^s very large, amplitudes of first two swings on Galitzin E component record: +27.5,-51.9; trace too faint for N to be measurable. ($S_c S$)_E 26^m.6. SS_N 28^m.6. 31^m.0 large swings on E , SSS or L ?

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Seismometric readings: Notation

P — normal first preliminary tremors, longitudinal waves.

P+ — first wave condensational (away from the epicentre).

P- — first wave dilatational (towards the epicentre).

P ($\pm a, \pm b, \pm c$) — *a*, *b* and *c* are trace amplitudes in mm. of first swing on NS, EW and vertical component Galitzin records respectively. + indicates ground motion directed to N, to E or up, — indicates ground motion to S, to W or down. When a second set of amplitudes is given it refers to the second swing. If an amplitude is not measurable the number is replaced by *x*.

PP... — longitudinal waves reflected at the earth's surface.

S — normal second preliminary tremors, transverse waves.

SS... — transverse waves reflected at the earth's surface.

PS; PPS; ... — waves reflected at the earth's surface which travel partly as longitudinal, partly as transverse waves.

SKS — waves which traverse the mantle as transverse waves but are refracted through the core with longitudinal oscillation.

PKS — waves which pass the mantle on one side of the core as longitudinal waves, on the other side as transverse waves and are refracted through the core with longitudinal oscillation.

SKKS — waves which traverse the mantle as transverse waves, are refracted through the core with longitudinal vibration and are reflected on its inner boundary.

L — long, or surface, waves; main phase.

M — waves of greatest amplitude in the surface waves.

i — sharply defined beginning of a phase.

e — gradual beginning of a phase.

Δ — arcual distance from the station to the epicentre.

*) affixed to time of phase indicates that the beginning is in a time-mark.

*) affixed to number and date refers to Notes.

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